Industrial Hygiene Vibration Monitor

Model IHVM 100

Typical Applications

- Worker Exposures
- Ergonomic Evaluation
- Workstation Design and Optimization
- Assess Risk of Injury
- Qualify Hand-tool Performance
- Determine effectiveness of Anti-Vibration gloves and materials

Features

- Frequency weightings and measurements for Hand-Arm and Whole Body Vibration
- Conforms to ISO Standards 2631 and 5349
- Simultaneous 3-channel Measurements: X, Y and Z axes, plus Sum (S)
- Lightweight and Portable - operates from two AA batteries or AC power supply
- Records up to 200 hours of measurement time history
- Programmable AC or DC Signal output
- Serial Interface to PC (115.2 kBaud)

Exposure of workers to high levels of vibration has been shown to cause permanent injury if left unchecked and untreated. Determining the risk of exposure to excessive vibration levels that are routinely encountered when using machines in repetitive work activities should be considered as part of a comprehensive Ergonomic evaluation program.

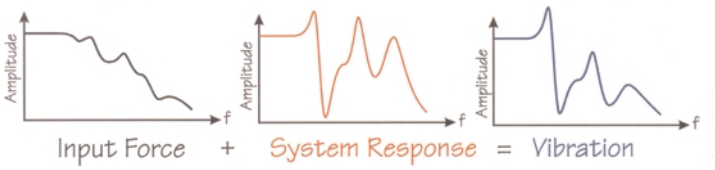
Until now, obtaining objective and repeatable vibration level data has been far more of a chore than is necessary. The IHVM 100 from Larson Davis provides a practical means for quantifying exposure data on the job, whether the work is performed inside manufacturing or process plants or at the most remote agricultural, mining or logging sites.

Wherever there is work to be done using heavy equipment or rotating or reciprocating hand tools powered by air, electricity, or internal combustion, the IHVM 100 is the easy way to obtain and document the levels of exposure that have been proven to cause a wide range of potential injury including 'Vibration White Finger Disease' (VWF) and other more insidious physical effects.

IHVM 100 Simplifies Vibration Exposure Monitoring

The IHVM 100 is a hand-held instrument for measuring human exposure to vibration, performing relevant calculations and providing overall metrics on its LCD display. Detailed vibration levels are easily stored in its built-in data logger, which can hold up to 100 separate time-history test files including all required metrics. This information can then be downloaded to a PC for analysis and archiving.

Measuring all three axes of vibration simultaneously greatly simplifies the setup of a test and enhances the repeatability and correlation of the vibration data. From the three channels of measured data, the IHVM 100 automatically calculates the important vector sum information and presents it as a fourth set of data values. For compliance with the latest measurement standards, the IHVM 100 employs digital filters for each channel that can be enabled as needed, and will never be obsolete - should standards change, the filters can upgraded - electronically!



Configured as a complete system including everything from sensors to software, the IHVM 100 comes with everything needed to confidently generate meaningful exposure documentation. From mechanical hand-arm adapters that locate the sensors properly in relation to the operator's grip of the tool - or a 'seat-pad' accelerometer for measuring Whole Body vibration, you'll have all the right bits and pieces to make measurements accurately and consistently. What's more, with Blaze software, you'll have a simple means of controlling the instrument and analyzing the resulting data.

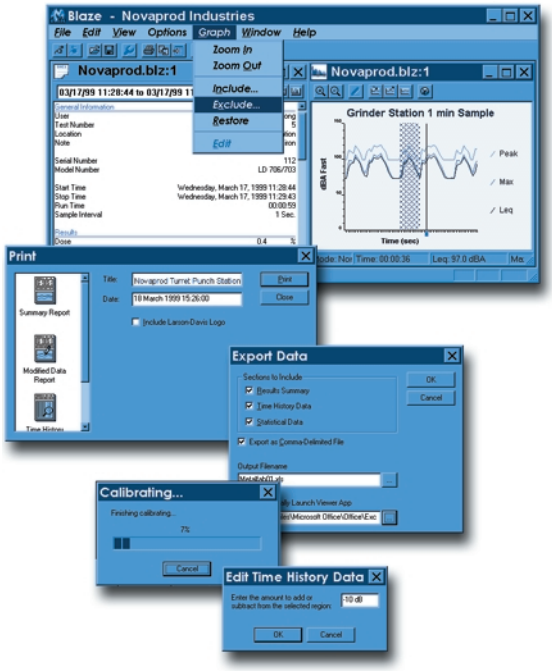
To increase user-friendliness, the IHVM 100 comes standard with up to four out of eight possible language options - including Italiano, Español and Deutsch! Any way you say it, the IHVM 100 is the best solution for Safety and Health professionals when it comes to vibration exposure monitoring.

Glove Transmissibility:

How to know if your PPE is doing its job...

Only Larson Davis offers a unique 'Palm Adapter' that locates a sub-miniature tri-axial accelerometer (sensor) in a specially designed 'cup'. This cup fits unobtrusively in the worker's palm, and can measure the vibration levels with and without a vibration damping glove in place - thus providing you real data on how well your PPE is working!

Supported by BLAZE® Application Software



BLAZE is the Industrial Hygiene and Safety Professional's analysis package of choice - combining ease-of-use with powerful analysis and reporting capability, BLAZE makes gathering and managing your vibration exposure data an absolute breeze! Combining summary data and a concise color graph of the vibration levels over time on just one page, you can easily present reports that are clear and understandable by workers and management alike. The ability to present detailed time-history reports and labeled graphs in addition to the summary reports gives even more presentation options.

Blaze SOFTWARE

Blaze makes instrument calibration, setup and deployment a snap - no need to press any keys - if you prefer, simply create and store multiple setup files in a Blaze 'library' to cover all your possible measurement applications. Blaze even stores individual calibration data on all your accelerometers, and makes changing from Hand-arm to Whole body measurement setups effortless and foolproof!

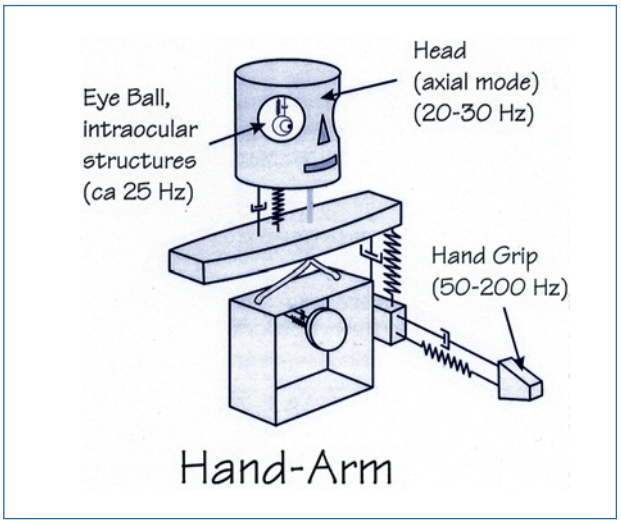
And for those who do noise exposure monitoring, you'll be glad to know Blaze supports the Larson Davis Spark® series personal noise dosimeters! Contact your Larson Davis representative for info.

About Human Exposure to Vibration in the Workplace

Risks to workers from exposure to high levels of vibration include decreased performance and even permanent injury. Two common types of vibration exposure have been identified as deleterious: Hand-Arm vibration and Whole-Body vibration.

These exposures are prevalent in the following applications:

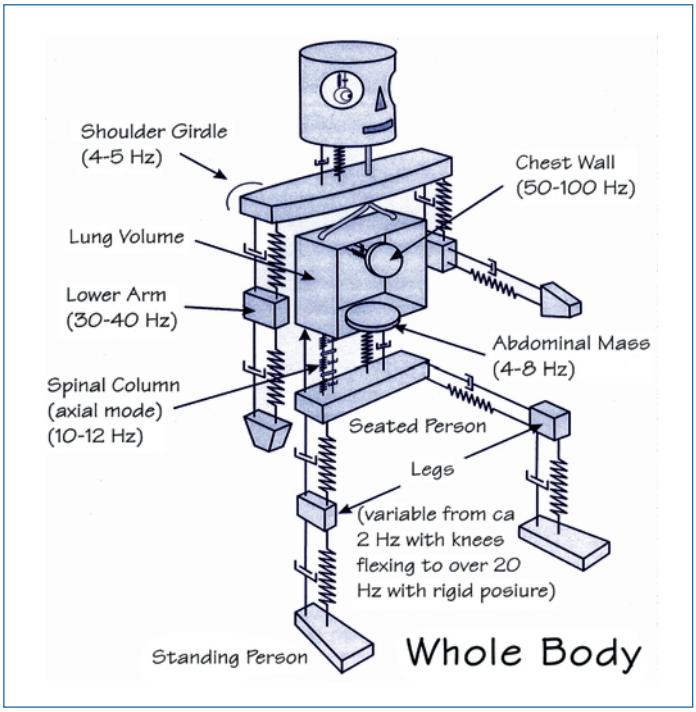
- Construction
- Foundries / Metalworking
- Transportation / Material Handling
- Logging
- Shipbuilding
- General Industrial Hygiene



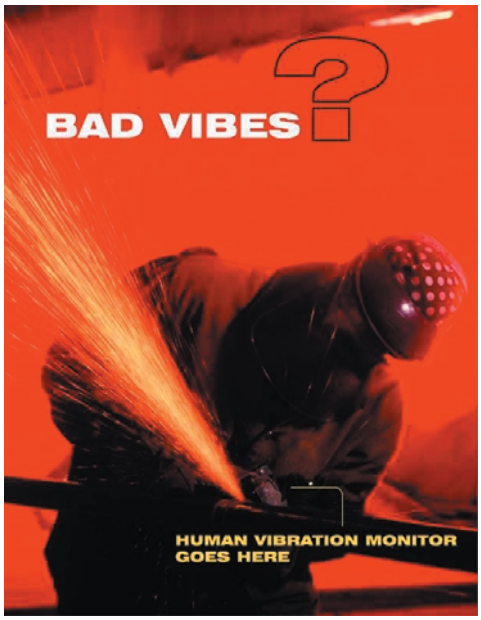
Worker exposure to high levels of vibration from powered hand tools can cause vibration syndrome symptoms such as numbness, pain, tingling and blanching. Vibration syndrome exposures induce adverse circulatory and neural effects in the fingers and hands that can become irreversible if left unchecked over as little as one year's time. Reduced tactile feeling and dexterity resulting from these exposures decreases workers' ability to perform critical tasks with precision. Often called vibration white finger disease (VWF), this condition is progressive and debilitating. Pneumatic- and electric- powered hand tools are often the cause of these unacceptable exposure levels, and even hand tools that were initially selected to emit lower levels of vibration may degrade through typical use and lack of (or improper) maintenance, leading to increasing and ultimately unacceptable levels over the working life of the tool.

High levels of Whole-Body vibration exposure are common to workers who operate heavy machinery, material handling and transport equipment, or whose operator stations are in proximity to heavy rotating, stamping or reciprocating machinery. Physical effects to the worker can include damage to the spinal column, and can manifest as low back pain or back, neck and shoulder disorders. Some studies point to possible negative reproductive effects in female populations exposed to high levels of Whole Body vibration.

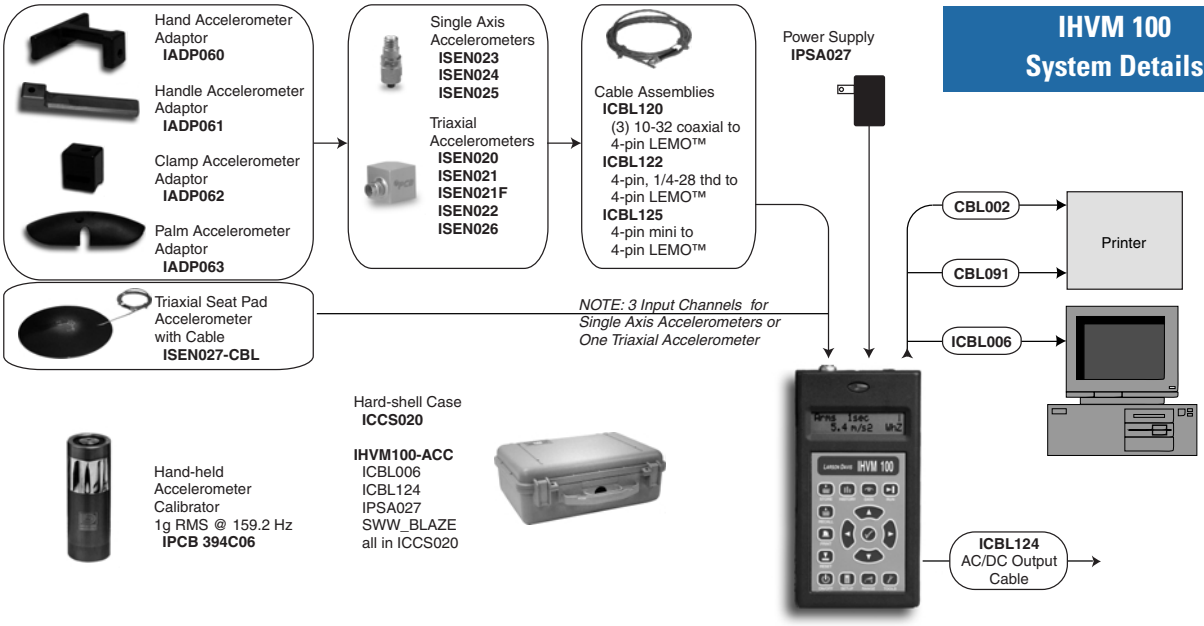
Until now, it has been difficult to quantify these exposures accurately and consistently. Vibration must be measured in three directions, or axes, simultaneously and this acceleration information must be integrated into useful values and scientific units of measure. Further, measuring the frequency range of the vibration is critical to assessing the potential for physical damage. For example, the frequencies of interest in determining potential injury from hand tools are as high as 2500 Hz, whereas Whole-Body vibration exposures are most damaging at lower frequencies - in the case of the spinal column, primarily from about 0.2 to 8 Hz.



Recent ISO standards have been promulgated that define measurement criteria and exposure limits that are useful and practicable for Safety and Industrial Hygiene professionals to implement. This methodology uses a broadband measurement of only the frequencies of interest for determining the severity of the two main types of exposures. This approach simplifies the number of readings that must be taken, and coupled with the IHVM100, vastly increases the speed at, and accuracy of which an assessment can be made.



IHVM 100 System Details



Technical Specifications

Input types:	ICP® sensors, charge output sensors, direct voltage
Input range:	>100 dB (in multiple ranges)
Range gain:	×1, ×10, ×100, ×1000
Calibration:	By level or sensor sensitivity entry
Units:	m/s^2, cm/s^2, ft/s^2, in/s^2, g, dB
Metrics for each mode:	
Vibration:	Arms, Amin, Amax, Aeq, Amp, PEAK
Hand-arm:	Arms, Amin, Amax, Aeq, Amp, PEAK, A(1), A(2), A(4), A(8), A(8) AET
Whole body:	Arms, Amin, Amax, Aeq, Amp, Peak, CFmp, CF, VDV
Frequency weightings:	
Vibration:	Ws (Severity), Fa (0.4 Hz to 100 Hz), Fb (0.4 Hz to 1250 Hz), Fc (6.3 Hz to 1250 Hz)
Hand-arm:	Wh
Whole body:	Wb, Wc, Wd, We, Wg, Wj, Wk, WB
Setups:	Store up to 10 user setups
Memory:	100 measurements, 1 min to 99 hr
Time history:	120 samples of Arms and PEAK at a period of 1, 2, 5, 10, 20, 30, 60 seconds
Interface:	RS-232 on 8 pin DIN, up to 115 kbps
Printout:	Custom 3 line header, data and time history
Outputs for each channel:	
AC:	Weighted or band-limited
DC:	rms, min, max, peak, sum rms, sum max, sum min, sum peak
Peak:	± 0.5 dB accuracy
Power:	(2) AA batteries (IEC Type LR6) *(batteries included)*
Weight:	300 gm (10.6 oz)
Dimensions:	1.1 × 3.3 × 6.0 in (28 × 84 × 152 mm)
Standards met:	ISO 8041:1990/Amd 1:1999, 2631-1:1997, 2631-2:1989, 2631-4:2001, 5349-1:2001, and 5349-2:2001, plus it provides the Whole Body frequency weighting Wg specified in the British Standard BS 6841:1987. CE compliant.
User manual:	*(included)*

Accessories (optional)

IADP060:	Hand accelerometer adaptor "T" bar
IADP061:	Handle accelerometer adaptor, straight bar
IADP062:	Clamp accelerometer adaptor, mounting block with clamp
IADP063:	Palm accelerometer adaptor
IADP064:	IHVM100 adaptor kit includes hand, handle, clamp and palm adaptors
ICBL006:	Serial interface cable for IHVM100. Used to connect to a PC
ICCS020:	IHVM100 Hard shell carrying case

IHVM100-ACC:
Accessories include one each: ICBL006 RS-232 Computer interface cable, ICBL124 AC/DC Output cable, ICCS020 IHVM100 Hard shell carrying case, IPSA027 IHVM100 Power supply, SWW_BLAZE® Analysis software for IHVM100.

IPCB 394C06:
The 394B06 provides a controlled vibration level for verifying sensitivity of accelerometers of up to 85 grams in weight.

IPSA027:	90 to 264V to 12V switching power supply for IHVM100
ISEN020-CBL:	Triaxial accelerometer, 1 mV/g ICP® & ICBL122
ISEN021-CBL:	Triaxial accelerometer, 10 mV/g ICP® & ICBL122
ISEN021F-CBL:	Triaxial accelerometer, 10 mV/g ICP® & ICBL122. The ISEN021F has an internal filter, which helps attenuate high frequency vibrations before they can overload the internal preamplifier in the accelerometer
ISEN022-CBL:	Triaxial accelerometer, 100 mV/g ICP® & ICBL122
ISEN023-CBL:	Single axis accelerometer, 1 mV/g ICP® & ICBL120
ISEN024-CBL:	Single axis accelerometer, 10 mV/g ICP® & ICBL120
ISEN025-CBL:	Single axis accelerometer, 100 mV/g ICP® & ICBL120
ISEN026-CBL:	Triaxial palm accelerometer, 10 mV/g ICP® & ICBL125
ISEN027-CBL:	Seat pad accelerometer, triaxial & ICBL122
SWW_BLAZE:	Dosimetry software for IHVM100 and Spark® family instruments

Available Configurations

IHVM100-L(X): NOTE: (X) denotes LANGUAGE OPTION - Select from L1, L2, L3 or L4 (below)
OPTION L1: English, Spanish, German, and Italian.
OPTION L2: English, German, Portuguese and Czech.
OPTION L3: English, German, Italian and French.
OPTION L4: English, German, Dutch and French.

IHVM100-L(X)-HA:
Same as IHVM100-L(X) plus one each: IHVM100-HA Hand-Arm filter option, IADP060 Hand accelerometer adaptor "T" bar, IADP061 Handle accelerometer adaptor, straight bar, IADP062 Clamp accelerometer adaptor, mounting block with clamp. *NOTE: Sensor and cable must be purchased separately.*

IHVM100-L(X)-HAGT:
Same as IHVM100-L(X) plus one each: IHVM100-HA Hand-Arm filter option, IADP060 Hand accelerometer adaptor "T" bar, IADP061 Handle accelerometer adaptor, straight bar, IADP062 Clamp accelerometer adaptor, mounting block with clamp, IADP063 Palm accelerometer adaptor. *NOTE: Sensor and cable must be purchased separately.*

IHVM100-L(X)-GT
Same as IHVM100-L(X) plus one each: IHVM100-HA Hand-Arm filter option, IADP063 Palm accelerometer adaptor. *NOTE: Sensor and cable must be purchased separately.*

IHVM100-L(X)-ALL:
Same as IHVM100-L(X) plus one each: IHVM100-HA Hand-Arm filter option, IHVM100-WB Whole Body filter option, IADP060 Hand accelerometer adaptor "T" bar, IADP061 Handle accelerometer adaptor, straight bar, IADP062 Clamp accelerometer adaptor, mounting block with clamp, IADP063 Palm accelerometer adaptor. *NOTE: Sensor and cable must be purchased separately.*

IHVM100-L(X)-HAWB:
Same as IHVM100-L(X) plus one each: IHVM100-HA Hand-Arm filter option, IHVM100-WB Whole Body filter option, IADP060 Hand accelerometer adaptor "T" bar, IADP061 Handle accelerometer adaptor, straight bar, IADP062 Clamp accelerometer adaptor, mounting block with clamp. *NOTE: Sensor and cable must be purchased separately.*

IHVM100-L(X)-WB:
Same as IHVM100-L(X) plus one each: IHVM100-WB Whole Body filter option

NOTE: Cables and sensors available separately; consult factory

Larson Davis
A PCB Group Co.

Larson Davis provides a complete line of acoustic measurement tools including dosimeters, sound level meters, real time analyzers, preamps, calibrators, and microphones.